

Research on the Industry-Education Integration for the Cultivation of Compound Management Talents

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Abstract: In view of the current problems of industry-education integration in financial and economic colleges, such as low levels of cooperation, insufficient student awareness, weak service capabilities, and incomplete quality assurance systems, this paper explores the innovative mechanism of industry-education integration in financial and economic colleges. First, based on a static perspective and adopting the ideas of Checkland's soft system methodology, a theoretical model of the innovation mode of industry-education integration in financial and economic colleges is constructed from the five elements of 'concept-institution-subject-activity-physics'. Second, from a dynamic perspective, this paper focuses on the operational mechanism of industry-education integration in financial and economic colleges, and studies the complete process of its implementation and dynamic evolution from four aspects: formation mechanism, organizational mechanism, behavioral mechanism, and evaluation mechanism. An analytical framework for industry-education integration in financial and economic colleges is proposed, which provides a reference for the industry-education integration cultivation of compound economic and management talents in financial and economic colleges.

Keywords: Industry-education integration, Cultivation of compound economic and management talents, Soft system methodology.

1. Introduction

Business and management education in higher education plays a vital role in serving national strategies and meeting industrial needs. Against the backdrop of a new round of scientific and technological revolution and industrial transformation reshaping the global economic structure, finance and economic universities shoulder a growing responsibility for talent development, scientific research, social services, cultural heritage and innovation, and international exchange and cooperation. Against this background, China has proposed the concept of 'new liberal arts' program, placing new demands on liberal arts education to innovate talent development methods and improve the quality of talent development, aiming to address a series of issues currently facing humanities and social science education in higher education. Within this 'new liberal arts' context, the cultivation of business and management talent requires further strengthening of top-level design and the close integration of curriculum and practical teaching systems, creating an urgent need for industry-university integration in education. The integration of industry and education can cultivate high-quality, multi-faceted business and management talents that are urgently needed for the country and industry by integrating industrial information and resource elements into core procedures such as the determination of training objectives, design of training programs, implementation of training processes, and evaluation of training quality in business and management education.

Promoting industry-education integration and fostering the organic connection between the education chains, industrial chains, and innovation chains has become a crucial task for the connotation-oriented development of higher education in the new era. However, identifying the characteristics and positioning of the industry-education integration of business

and management talent cultivation is a key issue facing finance and economic universities. Based on the current problems and advantages of industry-education integration in finance and economic universities, this paper adopts the ideas of Checkland's soft system methodology and combines it with the innovative practice of industry-education integration in the School of Business Administration of Anhui University of Finance and Economics. By combining static theory with dynamic practice, this paper constructs a theoretical model for the industry-education integration training model of business and management talents in financial universities, and explores the implementation process of industry-education integration for the cultivation of business and management talents in financial universities. This research will help finance and economic colleges to establish the goals, plans and systems for the integration of industry and education for the training of management talents throughout their life cycle based on the needs of enterprises for contemporary management talents, enrich and develop the training model of the integration of industry and education for management talents.

2. Industry-education Integration and Its Existing Problems

(1) The connotation of industry-education integration. Committee & Klingström proposed that industry-education integration is a talent development model that closely links educational activities with social production activities [1]. It features the integration of training and study, two-way participation, and social service. Bruegge [2] and Griddle [3] pointed out that industry-education integration will be influenced by the market economy, and its subjects are characterized by diversity. Whittle & Hutchinson believe that there are three levels of relationship between educational development and social development: the integration of education with overall social development trends, the

interdependence of higher education institutions with industrial sectors, and the interdependence of higher education institutions with their own development [4]. Therefore, the connotation of industry-education integration should be understood from the 'macro-meso-micro' three levels: the coordination of education with social and economic development, and the operating system of universities and the teaching model of higher education.

(2) The existing problems of industry-education integration. Existing industry-education integration activities are primarily plagued by issues such as a lack of government involvement, funding shortages, simple cooperation model, insufficient corporate motivation to participate, lagging efforts to develop a dual-qualified workforce, and inadequate quality assurance and evaluation systems. Huang Lin pointed out that the challenges facing industry-education integration include: limited corporate enthusiasm, insufficient level and depth of integration, difficulties in resource integration, an inadequate policy support system, insufficient motivation for integration [5]. Studies by Billett, Clemans & Seddon have found that some companies are unsure whether students' professional skills meet requirements, leading to low enthusiasm for industry-education integration [6]. Enterprises and industries should be encouraged to participate in universities' efforts to cultivate talents. Dedicated steering committees should be established for each industry to forecast job opportunities and participate in decision-making on major issues such as school program design and teaching models. Muhammad & Shahid [7] and Fien, Maclean & Park [8] found that the curriculum offered by higher vocational colleges was misaligned with the requirements of businesses, resulting in students spending significant time adapting to the workplace. Joint ventures between higher vocational colleges and businesses can help schools gain support from businesses, adjust their program offerings and teaching models to meet their needs, and improve the quality of talent development. Yager & Silverman [9], Cole [10], and Laine [11] have proposed that colleges should establish industries aligned with their strengths in their majors and, leveraging these industries, provide experimental bases and internship opportunities for faculty and students.

3. The Dilemma of Cultivating Business and Management Talents through Industry-Education Integration in Finance and Economic Universities

In the process of promoting the integration of industry and education, finance and economic colleges have initially formed a cultivation framework with 'knowledge-ability-quality' as the main line, and have explored teaching reform, teacher development, equipment update and school-enterprise cooperation. However, they still face many deep-seated practical problems that restrict the quality of talent training and the degree of fit between industry needs with talent training. These problems are mainly reflected in the following four aspects.

(1) The curriculum system is out of touch with industry practice and the depth of interdisciplinary integration is insufficient. Although the courses of finance and economic colleges have advantages in economics and management, they have shortcomings in the depth, breadth and cutting-edge nature of the courses, and the speed of course updates lags

behind the pace of industry technology iteration. Interdisciplinary courses are mostly mechanical splicing and fail to achieve the organic integration of management, economics, data, law and other knowledge. Although students have mastered concepts in multiple fields, they lack the ability to comprehensively apply knowledge to solve complex problems in real scenarios, resulting in a structural mismatch between talent training and the needs of industrial upgrading.

(2) Structural deficiency of the teaching staff and difficulty in converting practical experience. Most professional teachers in finance and economic colleges are fresh doctoral graduates from universities. Although they have solid theoretical foundation and scientific research capabilities, they generally lack practical experience in front-line management in enterprises. Although universities have implemented the system of teachers working in enterprises, the assessment and evaluation system still focuses on papers and projects, and teachers' enthusiasm and persistence in participating in enterprise practice are insufficient. On the other hand, although industry mentors from enterprises have rich practical experience, their teaching concepts and methods are relatively traditional, making it difficult to transform implicit knowledge systems into teaching resources. The proportion of 'dual-qualified' teachers who are both knowledgeable in theory and practice is relatively low, which directly affects the cultivation of students' practical ability and innovative thinking.

(3) Insufficient support for practical teaching conditions and lagging digital platform construction. Although universities continue to invest in the construction of laboratories, the speed of equipment updates still cannot keep up with the pace of digitalization and intelligent transformation of the industry. Some universities' practical training platforms lack advanced teaching tools. Virtual simulation projects mostly remain at the demonstration stage, lack interactivity and practicality, and cannot simulate the uncertainty and complexity of the real business environment. Practical teaching resources are unevenly distributed, and some financial universities lack continuous investment and systematic planning in the construction of experimental platforms, which restricts the improvement of students' new technology application capabilities and digital literacy.

(4) The college-enterprise cooperation mechanism is not yet sound, and the integration of industry and education is superficial. Currently, college-enterprise cooperation mostly stays at the superficial level of student internships and corporate lectures, lacking in-depth collaboration in curriculum co-construction, technology research and development, and teacher co-training. For reasons such as intellectual property protection and production efficiency, enterprises are often reluctant to open core business processes and real project data to students, resulting in fragmented and marginalized internship content. Although the number of cooperative centers has increased year by year, there is a lack of a stable operating mechanism and benefit-sharing model, and the internal motivation for enterprises to participate in talent training is insufficient. In addition, the voice of industry and enterprises in the formulation of talent training programs in colleges and universities is relatively weak, resulting in a disconnect between training goals and job competency requirements. Although graduates have theoretical knowledge, they find it difficult to quickly adapt to the actual needs of enterprises. In summary, the integration of industry and education in the cultivation of business and management

talents in finance and economic universities still faces realistic difficulties such as lagging curriculum content, unbalanced faculty structure, insufficient practical conditions, and loose cooperation mechanisms. Solving these problems requires colleges and universities to fundamentally break away from traditional path dependence and build a dynamic adjustment mechanism guided by industry needs.

4. A Theoretical Model for Industry-Education Integration in the Cultivation of Business and Management Talents in Finance and Economic Universities

Based on the current challenges and strengths of industry-education integration in finance and economic universities, this study employs the principles of Checkland's soft systems methodology to construct a theoretical model for the five-element industry-education integration model for the cultivation of business and management talent in finance and economic universities.

(1) Conceptual elements. Conceptual elements are the soul guide and value cornerstone for building an industry-education integration model. The industry-education integration training of management talents in finance and economic colleges must first achieve a fundamental shift from 'supply-oriented' to 'demand-oriented', with the mission of 'cultivating high-quality workers and technical and skilled talents' and the vision of 'promoting the organic connection between the education chain, talent chain, industrial chain, and innovation chain', and establish the strategic concept of 'coexistence and prosperity, and co-creation of value'. Colleges and universities need to take the initiative to break the barriers of the ivory tower and no longer regard themselves as closed knowledge authorities, but as open innovation nodes and talent think tanks in the regional economic ecology. Both universities and enterprises should jointly analyze the cutting-edge trends and future challenges in the fields of finance, accounting, digital economy, etc., and jointly define new standards and specifications for talent training to ensure a dynamic match between education supply and industry demand. At a deeper level, this concept goes beyond the simple exchange of internship positions. It seeks to create new knowledge, new technologies and new business value through joint scientific research and overcoming difficulties. It plays a leading role in the overall industry-education integration for the cultivation of management talents in finance and economic universities, guiding both parties of industry-education cooperation to formulate a set of scientific and rigorous institutional norms, and injecting continuous endogenous power into the industry-education integration education model.

(2) Institutional elements. Institutional elements are the rigid framework that guarantees the stable operation and sustainable development of the industry-education integration model. Institution is the mechanism guarantee for the industry-education integration education, regulating the behavior patterns of the participating subjects. Institutional innovation is the key to changing human behavior. Without a sound institutional system, even the most advanced ideas will be difficult to implement. The construction of the industry-education integration model requires top-level design from the three key levels of organizational management, incentive evaluation and resource allocation. In terms of organizational

management, a substantive industry-education integration college or collaborative governance committee should be established, giving it autonomy in enrollment, training and resource integration, so as to achieve equal rights and responsibilities and joint decision-making between the school and the enterprise. In terms of incentives and constraints, the traditional teacher evaluation system must be reformed, and the results of industry-education integration such as course co-construction, horizontal projects, and enterprise services must be elevated to the same level of importance as academic papers. At the same time, feedback mechanisms such as tax incentives and honorary recognition should be designed for enterprises and their mentors. In terms of benefit distribution, a sustainable investment and benefit sharing system must be established. By setting up special funds and clarifying the ownership of intellectual property rights and the distribution of benefits, the enthusiasm of all parties involved can be effectively mobilized, potential risks in cooperation can be resolved, and the stability and in-depth integration process can be ensured.

(3) Subject elements. Subject elements are the dynamic cells that drive the coordinated operation and functional complementarity of the industry-education integration model. A successful integration ecosystem depends on the effective coordination and role reshaping of multiple subjects. The subjects of industry-education integration include students, teachers, universities, enterprises, and governments. In this model, universities are no longer the only knowledge authority, but are transformed into the source of theoretical innovation and basic research. The core of this model is to cultivate a 'dual-qualified' teaching team that is both proficient in academics and familiar with the industry. Enterprises should transform from passive recipients of talent to active partners in talent cultivation and value co-creators. The deep participation of their business departments is crucial. The government should play the role of a guide and service provider, creating a good environment for integration through policy inclination and platform building. Industry organizations should play the role of connectors and standard setters, publishing talent needs and certifying curriculum systems. Finally, the subject status of students must be activated, so that they can transform from passive recipients of knowledge to active explorers who enter practice with questions, learn by doing, and can provide feedback on the teaching closed loop.

(4) Activity elements. Activity elements are the operational processes that carry the educational value and innovative functions of the industry-education integration model, enabling various subjects to work together to jointly carry out value creation activities in industry-education integration. Conceptual and institutional elements ultimately need to be concretized through a series of practical activities throughout the entire process of talent training. At the talent training level, a systematic progressive system of 'curriculum co-construction-practical teaching-dual tutor system' should be designed to jointly develop project-based courses such as 'Production Operation Practice' and 'Corporate Strategic Management Case Analysis', and build a spiral upward path from cognitive internship to on-the-job internship. At the scientific research level, we should rely on the co-built joint laboratories, jointly apply for horizontal projects, and jointly tackle the real business pain points of enterprises (such as big data auditing and quantitative investment models) to promote the transformation of applied scientific research results. At the

innovation and entrepreneurship level, we can inspire teachers and students to transform their creativity into solutions and entrepreneurial projects to solve practical business problems by co-building incubators and holding innovation and entrepreneurship competitions with topics set by enterprises, thus forming a virtuous cycle of 'teaching-research-entrepreneurship'.

(5) Physical elements. Physical elements are the resource foundation and virtual carrier that support the efficient implementation of various activities in the industry-education integration model. Resources are the foundation of innovation, and certain resources are the basic conditions for the survival, development and cooperation of human beings and their organizations. In terms of physical space, highly simulated practice platforms should be built on campus, such as 'simulated banks' and 'cross-disciplinary enterprise operation simulation training centers' to create an immersive career development environment. Off-campus practice bases for deep cooperation should be established to make them a test field for teachers and students to contact cutting-edge business. In the virtual realm, both universities and enterprises must build an integrated industry-education integration information management platform to digitize project coordination, process management, and outcome evaluation. Simultaneously, they must utilize technologies like VR/AR to develop virtual simulation teaching platforms, allowing students to simulate high-risk management decisions in a dynamic environment. Furthermore, while ensuring legality and compliance, they should incorporate desensitized business data from enterprises to build high-quality teaching and research databases. This will provide the most valuable production materials for the industry-education integration of financial and economic universities, truly bridging the gap between learning, research, and application.

5. The Operating Mechanisms of Industry-Education Integration in the Cultivation of Business and Management Talents in Finance and Economic Universities

Based on the overall picture of the industry-education integration system for the cultivation of business and management talents in finance and economic universities as described above, this study explores the operational mechanisms of industry-education integration in the cultivation of business and management talents in finance and economic universities from a dynamic process perspective. It explores the collaborative mechanisms involving multiple parties, including enterprises, universities, and governments, and clarifies the process from disorder to order, and from formation to development.

(1) Formation Mechanism. The formation mechanism of industry-education integration is the logical starting point for the launch and development of the entire system. It comprises three sub-modules: motivational mechanisms, matching mechanisms, and exit mechanisms, which together lay the foundation for cooperation. A sound exit mechanism not only helps optimize the collaborative landscape but also forces all parties to prioritize contract performance and maintain the healthy operation of the integrated ecosystem.

1) Motivational Mechanism, which focus on the intrinsic motivations and external incentives for all parties involved. For businesses, participating in industry-education

integration is not only a manifestation of social responsibility but also a strategic choice for acquiring high-quality talent and promoting technological and management innovation. Universities, through industry-education integration, expand educational resources, enhance research effectiveness, and improve their social service capabilities. Governments, focusing on regional economic development and optimizing industrial structures, promote supply-side reform in education through policy guidance and financial support. Furthermore, external environmental factors such as industry development trends, pressures from technological change, and societal demand for practical talent also constitute important driving forces for integration.

2) Matching Mechanism, which primarily focus on the capabilities, needs matching, and selection process of various collaborating parties in the industry-education integration of business and management talents. Matching mechanisms are crucial for achieving effective cooperation. Their core lies in accurately analyzing and aligning the capabilities, needs, and resources of the collaborating parties. Universities need to clearly define their disciplinary strengths and talent development priorities. Enterprises need to articulate genuine, cutting-edge business needs and talent standards. Governments and industry associations should serve as information hubs and platforms for collaboration. By establishing a demand dissemination mechanism, a resource inventory system, and a collaborative platform, all parties can be encouraged to reach collaborative agreements based on aligned goals and complementary resources.

3) Exit Mechanism, which primarily constructs the trigger conditions for exiting the partnership based on factors such as the behavior, intentions, and capabilities of various collaborating parties in the industry-education integration of business and management talents. Specifically, it can be divided into contractual exit and punitive exit. Exit mechanisms are crucial for ensuring the quality of collaboration and the health of the system. They include two types: negotiated exit and punitive exit. Agreed exit refers to the natural termination of the relationship upon achievement of the collaboration goals or expiration of the agreement. Punitive exit involves terminating the collaboration in accordance with laws and regulations based on pre-set assessment criteria and trigger conditions for significant breaches of contract, breach of trust, or chronic underperformance during the collaboration process.

(2) Organizational Mechanism. The organizational mechanism provides institutional guarantees for the sustainable operation of industry-university integration, encompassing communication and coordination, incentives and constraints, and learning and growth, ensuring an orderly and efficient collaborative process.

1) Communication and coordination mechanisms, primarily encompassing the communication and coordination methods, content, and platforms for industry-education integration, serve as the 'nervous system' of organizational operations. They include regular joint meetings, dedicated working groups, information sharing platforms, and other mechanisms. Communication not only covers daily matters like project progress, resource allocation, and feedback, but also encompasses strategic goal alignment, cultural integration, and long-term planning. Leveraging modern information technology, a digital collaboration platform can be built to streamline the entire process from requirement release to process management and archiving, improving

communication efficiency and transparency.

2) Incentive and constraint mechanisms, primarily encompassing the objectives and methods of industry-education integration, compensation systems, performance appraisals, and reward and punishment mechanisms, are key tools for mobilizing the initiative of all parties. Regarding incentives, a diversified target approach and compensation system should be established. For example, this could include incorporating the results of teachers' participation in industry-education integration into professional title evaluation and performance appraisals, and providing companies with policy incentives such as tax incentives and brand promotion. Regarding constraints, a clear performance appraisal system and reward and punishment system should be established. Partners that fail to meet standards should be interviewed, rectified, or even withdrawn to ensure that the collaboration remains on track with its goals.

3) Learning and growth mechanisms, primarily constructed through formal systems such as training and learning, and informal systems such as technical exchange during the industry-education integration training process, should focus on the shared development of individuals and organizations during the collaborative process. These include formal training programs, such as joint university-enterprise teacher training programs and enterprise mentorship capacity building programs, as well as informal technical exchanges, seminars, and community interactions. By building a three-in-one learning network encompassing universities, enterprises, and individuals, we promote the two-way flow of knowledge and the mutual improvement of capabilities, making industry-education integration a true platform for organizational evolution and talent growth.

(3) Behavioral mechanisms. Behavioral mechanisms are the core procedure in transforming industry-education integration from concept to practice. They encompass four key components: resource integration, risk control, research results transformation, and profit distribution, and run throughout the entire collaborative process.

1) Resource integration mechanisms, primarily emphasize the systematic identification, allocation, and sharing of dispersed resources. Universities provide faculty, courses, research equipment, and academic networks. Enterprises invest in practical projects, technology platforms, industry data, and mentors. Governments and industry organizations provide policy support, platform development, and standard setting. By establishing a resource-sharing platform and collaborative processes, a 'physically decentralized, logically centralized' resource integration model is achieved, improving resource utilization efficiency and collaborative effectiveness.

2) Risk control mechanisms, primarily encompassing risk identification, risk assessment, and risk control, are crucial for the steady progress of collaborative efforts. Risk types include credit risk of partners, management risks during project execution, and legal risks such as technology leakage and intellectual property disputes. A systematic risk identification, assessment, and prevention system must be established. For example, through pre-collaboration due diligence, ongoing monitoring, and the development of risk contingency plans, potential issues can be addressed proactively to minimize uncertainty in collaboration.

3) Achievement transformation mechanisms, primarily encompassing national policy guidance, top-level design by partner institutions, third-party intermediaries, and

achievement transformation platforms, are crucial to the ultimate realization of the value of collaboration. This is driven by national policy guidance, top-level design by partnering institutions, professional services provided by third-party intermediaries, and the support of the results transformation platform. Specific forms include jointly developed technology patents, jointly developed courses and teaching materials, consulting reports addressing practical business issues, and incubated innovative and entrepreneurial projects. Smooth transformation channels and clear property rights arrangements are crucial prerequisites for achieving results.

4) Benefit distribution mechanisms, primarily encompassing the composition of distributable benefits, the basis for benefit distribution, and the method of benefit distribution, is the key to maintaining stable collaboration. Distributable benefits include direct economic gains, intellectual property rights, enhanced brand reputation, and priority recruitment for talent. The basis for distribution should comprehensively consider factors such as resource input, contribution, and risk assumption, and the distribution method should be clearly defined through an agreement, such as a one-time payment, profit sharing, or equity partnership. A fair and reasonable benefit distribution mechanism can effectively enhance collaboration and stimulate continued participation.

(4) Evaluation mechanisms. The evaluation mechanisms for the integration of industry and education in the cultivation of business and management talents in finance and economic universities are the subsequent stage of the entire innovation process. It is a summary of the past integration of industry and education in education, the basis for the current distribution of benefits, and the foundation for further deepening the integration of industry and education in education.

1) Synergy evaluation, which mainly constructs a measurement indicator system for the degree of synergy of cooperation between subjects, focuses on measuring the breadth, depth, and effectiveness of collaboration between stakeholders. A multi-dimensional indicator system encompassing strategic collaboration, resource collaboration, and cultural collaboration can be constructed, including indicators such as alignment of collaborative goals, resource sharing, communication frequency, and satisfaction. Through a combination of quantitative and qualitative methods, the strengths and weaknesses of collaboration can be revealed.

2) Innovation performance evaluation, which constructs an evaluation system from the aspects of scientific research projects, scientific research results and results transformation. Innovation performance evaluation focuses on the output effects of research and innovation. This evaluation system includes the number and level of joint research projects, jointly published papers and monographs, patents and software copyrights obtained, and the actual conversion rate of R&D results. This evaluation not only reflects the technological contribution of integration but also its potential to promote disciplinary development and industrial advancement.

3) Cooperation performance evaluation, which constructs an evaluation system from the aspects of education effectiveness, discipline construction results, base construction results, etc., focuses on educational outcomes and platform development achievements. Specific indicators include the improvement of students' practical skills, enterprise satisfaction, the number and quality of jointly

established bases, and the results of joint curriculum development. Furthermore, evaluation should include promoting discipline development, developing faculty, and enhancing social influence, comprehensively measuring the comprehensive value of industry-university integration.

6. Conclusion

The integration of industry and education in colleges and universities has been mentioned in many education development planning reports in China. However, how can finance and economic universities find the correct positioning and direction for the integration of industry and education in the cultivation of economic and management talents under the background of the new liberal arts, and build an effective model of integration of industry and education in the cultivation of talents? This has become a practical problem that urgently needs to be solved. This article selects the theoretical perspective of soft system methodology, combined with the innovative practice of cultivating economic and management talents in Chinese finance and economic universities, to explore the model and mechanism of the integration of industry and education in the cultivation of economic and management talents in China, in order to provide ideas for the transformation and development of Chinese finance and economic universities, and to provide certain reference for the innovative integration of industry and education in the cultivation of talents in finance and economic universities in terms of theory and practice.

(1) A 'five-element' model of industry-education integration with Chinese characteristics is constructed. From a static perspective, adopting the idea of Checkland's soft system methodology, combined with the innovative practice and theoretical research on the industry-education integration of economic and management talents in Chinese universities, a theoretical framework of the 'concept-system-subject-activity-physics' five-in-one industry-education integration model of finance and economic universities is constructed, clarifying the element composition and system structure of the industry-education integration model of finance and economic universities, which has certain guiding significance for the deep integration of industry and education in China.

(2) Extract the process mechanism of industry-education integration education of economic and management talents with the characteristics of finance and economic universities. From a dynamic perspective, drawing on the successful practices and experiences of the mechanism construction of industry-education integration education of economic and management talents in developed countries, the typical cooperation case of industry-education integration education of Chinese Finance and Economics University is analyzed, and the complete process of its implementation and dynamic evolution is studied from four aspects: the formation

mechanism, organizational mechanism, behavioral mechanism, and evaluation mechanism of industry-education integration, and extracting the industry-education integration mechanism for the cultivation of economic and management talents with the characteristics of finance and economic universities.

Acknowledgements

The authors gratefully acknowledge the financial support from the Philosophy and Social Sciences Project of Anhui Province: 'Research on the innovative path and system of domestic substitution of key core technologies under the leadership of chain leader enterprises (Project No.: AHSKQ2022D051)'.

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